The MCJ Model Workbook

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Contents

Preface

The first chapter discusses the use of the latest version of the MC model—denoted the MCJ model—on the website. The remaining chapters discuss various experiments that can be performed using the model. These are experiments that are in **Macroeconometric Modeling: 2018** (henceforth called **MM**), which is the main reference for the MCJ model. You can duplicate the results in **MM** by doing the experiments.

If you run an experiment, you can examine the results for any country and any variable in the model, including the bilateral trade flows—exports from country i to country j.

You will see that for most experiments the historical errors are added to the equations before the experiment is performed. This allows the perfect tracking solution to be the base path, from which changes can then be made. If you did not use the historical errors, you would have to first create a base path of predicted values, to which the new predicted path (after the experiment has been performed) would be compared. See Section 2.6 of **The US Model Workbook** for more discussion of this.

There may be a few rounding differences between the results in **MM** and the results you generate using the website. In addition, when you change CG for a particular experiment, you will see that the actual changes differ slightly from the changes you entered. This has to due with the fact that the left hand side variable of the CG equation is CG divided by $YS_{-1} \cdot PX_{-1}$, where PX is endogenous. The way the coding works on the website, changes in PX affect your chosen values of CG. This is not true of the coding used to generate the results in **MM**. The differences are, however, small and can safely be ignored.

Finally, this workbook is not self contained; it assumes that the reader has some understanding of the model. You should read the relevant parts of **MM** before using this workbook.

The MCJ2 Model

There is also a MCJ2 model on the website. This model differs from the MCJ model in 1) having a different equation 4 for China, 2) having equation 8 for China (the MCJ model does not have one), and 3) having fewer estimated trade share equations. This model is used for the results in Fair (2019), referenced in **MM**. These changes are discussed in the relevant sections in **MM**. All the experiments in this workbook can be done using the MCJ2 model. You will not get exactly the results in **MM** since the MCJ2 model is slightly different from the MCJ model, but the results will be close.

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Chapter 1

The MCJ Model on the Website

This chapter discusses practical things you should know when working with the MCJ model. It relies on Part 3 and Appendices A and B in **MM**. If you are planning to work with the MCJ model, it may be helpful to have hard copies of this material available for ease of reference. In what follows all references to sections, subsections, and tables are to those in **MM**.

1.1 Notation

The notation for the variables in the ROW model is presented in Tables B.1 and B.2 in Appendix B. Two letters denote the country (CA for Canada, JA for Japan, etc.), and the abbreviations are given in Table B.1. Up to five letters denote the variable (C for consumption, I for investment, etc.), and the names are given in Table B.2 in alphabetical order. The complete name of a variable for a country consists of the country abbreviation plus the variable name, such as CAC for Canadian consumption, JAI for Japanese investment, etc. The two letters EU denote the European countries in the model that are part of the EMU. These are: AU, FR, GE, IT, NE, FI, BE, GR, IR, PO, SP. (Luxembourg, which is also part of the EMU, is not in the model.) (GR joined January 1, 2001.)

1.2 Solution Options

There are three choices you can make regarding the solution of the MCJ model.

1. The prediction period, where the default is 2014-2016.
2. The number of within country iterations (denoted LIMITA) and the number of across country iterations (denoted LIMITB). The defaults are 10 for LIMITA

and 10 for LIMITB. As discussed below, these options are useful for checking if the model has successfully solved.

3. Whether or not you want to use the historical errors. The default is to set all the error terms equal to zero. If you use the historical errors and make no changes to any of the exogenous variables and coefficients, then the solution values of the endogenous variables will be the actual values—a perfect tracking solution—aside from rounding error. This option can be useful for multiplier experiments, as discussed below.

The way in which the model is solved is discussed in Section 7.6 in Appendix B. Because the MCJ model (unlike the US model alone) is not iterated until convergence (because LIMITA and LIMITB above are fixed), it may be the case that after the program finishes the model did not really solve. If you are concerned about this, there is one check that you can perform, which is to increase LIMITA and LIMITB. If the model has correctly solved, it should be the case the increasing LIMITA and LIMITB has a very small effect on the solution values. You can thus increase LIMITA and LIMITB and see if the output values change much. If they do not, then you can have considerable confidence that the model has been solved correctly. The maximum values of LIMITA and LIMITB that you are allowed are 15 and 15, respectively. Another check is that if the predicted values are either extremely large or extremely small, then the model is unlikely to have solved. If this is true, you have probably made extreme changes to one or more exogenous variables or coefficients.

1.3 Changing Stochastic Equations

There are four changes you can make to any of the stochastic equations:

1. Drop (or add back in) an equation. When an equation is dropped, the variable determined by the equation is taken to be exogenous, and it can be changed if desired. The default values for the variable are the historical values.

2. Take an equation to begin after the beginning of the basic prediction period. When an equation begins later than the basic prediction period, the variable determined by the equation is taken to be exogenous for the earlier period, and it can be changed if desired. The default values for the variable are the historical values. For quarterly countries the period that you want the equation to begin is a quarter, not a year. You can, for example, have an equation begin in 2014:2 when the basic prediction period is 2014-2016.

3. Add factor an equation, where the add factors can differ for different periods. For quarterly countries the add factors are for individual quarters, not years.

4. Change any of the coefficients in the stochastic equations. You cannot add variables to the equations.

1.4 Creating Base Datasets

In most cases when working with the model you will probably want to use the historical errors (i.e., set the errors equal to their estimated values and take them to be exogenous). If for any period you use the historical errors and solve the model with no changes in the exogenous variables and coefficients, you will get a perfect tracking solution. This is usually a good base to perform various experiments.

1.5 Treatment of the EMU Regime

As noted above, there are 10 countries in the model that are part of the EMU beginning January 1, 1999: AU, FR, GE, IT, NE, FI, BE, IR, PO, and SP. GR joined January 1, 2001. EU denotes these countries. Prior to 1999 each of these countries except GR has an estimated interest rate reaction function (equation 5), and each country except IT, FI, IR, and GR has an estimated long term interest rate equation (equation 6). In addition, GE has an estimated exchange rate equation where the exchange rate explained is the DM/$ rate, and each of the other countries has an estimated exchange rate equation where the exchange rate explained is the local currency/DM rate (equation 7).

For the EMU regime, which begins in 1999:1 for 10 countries and 2001:1 for GR, equations 5, 6, and 7 for the individual EMU countries are dropped from the model. EU equations 5, 6, and 7 are added beginning in 1999:1.

The software allows you to change the EU interest rate and exchange rate equations. The "country" that you will click is EU. Remember that these equations are only relevant from 1999:1 on. Also remember that the equations that have been dropped for the individual EMU countries from 1999:1 on are not part of the model from 1999:1 on. They only matter prior to 1999:1. For GR the switch date is 2001:1.

Chapter 2

Some Properties of the Model

Some properties of the model are reported in Section 1.2, *Has Macro Progressed?*, in **MM**. The prediction period is 2000:1–2005:4. If you do the following experiments using the MCJ model, you will exactly duplicate these results.

2.1 COG Increase

This experiment shows that the output multiplier for an increase in government purchases of goods of 1.0 percent of real GDP is 1.4 percent of real GDP after four quarters.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2005.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Change exogenous variables" and ask to change COG for the United States. Type in the COG increases quarter by quarter. Be sure to save the changes once you are done. The COG increases are (1.0 percent of GDPR):

	COG INCREASES
2000.1	30.89775
2000.2	31.48100
2000.3	31.51925
2000.4	31.69850
2001.1	31.60800
2001.2	31.77550
2001.3	31.67525
2001.4	31.76300
2002.1	32.05575
2002.2	32.23225
2002.3	32.38950
2002.4	32.41000
2003.1	32.57800
2003.2	32.88000
2003.3	33.43075
2003.4	33.82150
2004.1	34.01625
2004.2	34.26575
2004.3	34.57700
2004.4	34.87600
2005.1	35.24750
2005.2	35.43175
2005.3	35.72925
2005.4	35.93350

5. Click “Solve the model and examine the results”.

2.2 TRGHQ Increase

This experiment shows that the output multiplier for an increase in real federal government transfer payments of 1.0 percent of real GDP is 0.5 percent of real GDP after four quarters.

1. Click “Solve” under “MCJ Model” in the left menu and copy MCJBASE to a dataset you have named.

2. Click “Set prediction period” and set the period to be 2000 through 2005.

3. Click “Use historical errors” and set the option to use the historical errors.

4. Click "Change exogenous variables" and ask to change $TRGHQ$ for the United States. Type in the $TRGHQ$ increases quarter by quarter. Be sure to save the changes once you are done. The $TRGHQ$ increases are the same as the COG increases above.

5. Click "Solve the model and examine the results".

2.3 RS Increase

This experiment shows that the real output multiplier of an interest rate increase of 1.0 percentage points is -0.5 percent of real GDP after four quarters.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2005.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and drop the RS equation for the United States (equation 30).

5. Click "Change exogenous variables" and ask to change RS for the United States. Then add 1.0 to all the values. Be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

If you do this experiment for the 1994–1998 period and you decrease RS by 1.0 rather than increase it, you will duplicate the results in Table 1 in Subsection 4.4.2, "The Effects of a Decrease in RS," in **MM**.

2.4 CG Increase

This experiment shows that wealth effects from stock market changes are fairly large in the model. The experiment is an increase in CG of 10 percent of nominal GDP (40 percent at an annual rate) in 2000:1. The increase in real GDP after four quarters is 0.25 percent.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2005.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25).

5. Click "Change exogenous variables" and ask to change CG for the United States. Type in the CG increase for 2000:1, which is 1003.1 (40 percent of nominal GDP). Leave the other quarters the same. Be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

Note: this experiment will not exactly duplicate the results in **MM**, but the differences are very small. See the discussion in the Preface.

2.5 US Price Shock, RS exogenous

This experiment shows that positive price shocks are contractionary even if the Fed keeps the nominal interest rate unchanged. The decrease in real GDP after four quarters is 0.16 percent. This feature has important implications for monetary policy.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2005.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and drop the RS equation for the United States (equation 30).

5. Click "Modify equation coefficients" and ask to modify equation 10, the PF equation, for the United States. Then add .005 to the fifth coefficient in the equation (the constant term). Be sure to save the changes once you are done. The fifth coefficient should be .012835615.

6. Click "Solve the model and examine the results".

If you do this experiment for the 1994–1998 period, you will duplicate the results in Table 1 in Subsection 4.1.2, "Estimated Effects of a Positive Inflation Shock," in **MM**.

Chapter 3

Is Monetary Policy Becoming Less Effective Over Time?

This chapter presents the experiments in Section 4.7, *Is Monetary Policy Becoming Less Effective Over Time?* in **MM**.

3.1 Interest Payments Equation In: 2001:1–2002:4

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2001 through 2002.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and drop the RS equation for the United States (equation 30).
5. Click "Change exogenous variables" and ask to change RS for the United States. Then add 1.0 to all the values. Be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

3.2 Interest Payments Equation Out: 2001:1–2002:4

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2001 through 2002.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and drop the RS equation for the United States (equation 30).
5. Click "Change exogenous variables" and ask to change RS for the United States. Then add 1.0 to all the values. Be sure to save the changes once you are done.
6. Click "Drop or add equations" and drop the $INTG$ equation for the United States (equation 29).
7. Click "Solve the model and examine the results".

Do the above two experiments for the 2015:1–2016:4 period. Compare the two differences.

Chapter 4

Estimated European Inflation Costs

This chapter explains how to perform the German monetary policy experiment in Section 5.1, *Estimated European Inflation Costs from Expansionary Policies*, in **MM**. It duplicates the results in Table 1 in this section. This is a nice example for learning some of the features of the MCJ model and for learning how to work with it. Once you have mastered this experiment, you may want to perform others to examine what else macro policies might have done in the 1980s to reduce European unemployment and at what price level and inflation costs.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1982 through 1990.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and for the Germany drop the RS equation (equation 5).
5. Click "Change exogenous variables" and ask to change $GERS$ for Germany. Then add -1.0 for 19821-19834, add -.75 for 19841-19854, add -.5 for 19861-19874, and add -.25 for 19881-19904. Be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

Chapter 5

Testing for a New Economy in the 1990s

This chapter explains how to perform the "no stock market boom" experiment in Section 5.3, *Testing for a New Economy in the 1990s*, in **MM**.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1995 through 1999.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25).
5. Click "Change exogenous variables" and ask to change CG for the United States. Ask to replace each existing value with 124.5. Hit the enter key and then be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

Chapter 6

Policy Effects in the Post Boom U.S. Economy

This chapter explains how to perform the seven experiments in Section 5.4, *Policy Effects in the Post Boom U.S. Economy*, in **MM**.

6.1 Experiment 1: No Tax Cuts

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2004.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25) and the RS equation (equation 30).
5. Click "Change exogenous variables" and ask to change $D1G$ for the United States. Change the first quarter of the prediction period to be 20004 (not 20001) and the last quarter of the prediction period to be 20043 (not 20044). Then ask to replace each existing value with the actual value of $D1G$ in 2000:3, which is 0.10527. Hit the enter key and then be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

The model will be solved for the entire 2000:1–2004:4 period, but the period of interest is only 2000:4–2004:3. You can ignore the first three quarters of 2000 (there are no changes here anyway) and the last quarter of 2004.

6.2 Experiment 2: No G Increase

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2004.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25) and the RS equation (equation 30).

5. Click "Change exogenous variables" and ask to change COG for the United States. Then enter quarter by quarter the changes for COG for 2000:4–2004:3. (Make sure to save the changes once you are done.) These changes are:

	COG CHANGES
2000.1	30.89775
2000.2	31.48100
2000.3	31.51925
2000.4	31.69850
2001.1	31.60800
2001.2	31.77550
2001.3	31.67525
2001.4	31.76300
2002.1	32.05575
2002.2	32.23225
2002.3	32.38950
2002.4	32.41000
2003.1	32.57800
2003.2	32.88000
2003.3	33.43075
2003.4	33.82150
2004.1	34.01625
2004.2	34.26575
2004.3	34.57700
2004.4	34.87600
2005.1	35.24750
2005.2	35.43175
2005.3	35.72925
2005.4	35.93350

6. Click "Solve the model and examine the results".

The model will be solved for the entire 2000:1–2004:4 period, but the period of interest is only 2000:4–2004:3. You can ignore the first three quarters of 2000 (there are no changes here anyway) and the last quarter of 2004.

6.3 Experiment 3: No RS Decrease

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2004.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25) and the RS equation (equation 30).
5. Click "Change exogenous variables" and ask to change RS for the United States. Change the first quarter of the prediction period to be 20004 (not 20001) and the last quarter to beo 20043 (not 20044). Then ask to replace each existing value with 6.017. (6.017 is the actual value of RS in 2000:3, which you can see from the page you are on.) Hit the enter key and then be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

The model will be solved for the entire 2000:1–2004:4 period, but the period of interest is only 2000:4–2004:3. You can ignore the first three quarters of 2000 (there are no changes here anyway) and the last quarter of 2004.

6.4 Experiment 4: No Stimulus—Experiments 1, 2, and 3

1. Combine experiments 1, 2, and 3, i.e., change $D1G$, COG, and RS.

6.5 Experiment 5: No Stimulus and No Stock Market Decline

1. Do the set up for experiment 4 and then do the following extra steps.

2. Click "Change exogenous variables" and ask to change CG for the United States. Then type in the following changes in CG. (Make sure to save the changes once you are done.)

	CHANGES IN CG
2000.4	233.6364377
2001.1	235.1029462
2001.2	236.3933658
2001.3	237.8985975
2001.4	237.9940319
2002.1	238.9499975
2002.2	239.0618679
2002.3	239.0188709
2002.4	239.7247147
2003.1	240.5048411
2003.2	241.4795930
2003.3	241.7344321
2003.4	244.9782530
2004.1	247.7131508
2004.2	250.0174220
2004.3	253.1941501

3. Click "Solve the model and examine the results".

(These are the exact values of CG used in the experiment.)

6.6 Experiment 6: No Stimulus and No Export Decline

1. Do the set up for experiment 4 and then do the following extra steps.

2. Click "Examine the results without solving the model." List the values of EX and YS for 2000:1–2004:4. Compute EX/YS for 2000:3, and call this γ. This value is 0.11125. For the quarters 2000:4–2004:3, compute $1000(\gamma YS - EX)$, and call these the "$USXS$ differences." Then return to the main menu page.

3. Click "Change exogenous variables" and ask to change $USPSI2$ for the United States. Type in the $USPSI2$ changes quarter by quarter. The relevant period is 2000:4–2004:3. (Make sure to save the changes once you are done.) The changes are:

	CHANGES IN USPSI2
2000.4	0.01142
2001.1	0.02773
2001.2	0.05595
2001.3	0.09326
2001.4	0.11884
2002.1	0.10774
2002.2	0.09542
2002.3	0.09500
2002.4	0.10685
2003.1	0.11561
2003.2	0.12050
2003.3	0.10753
2003.4	0.08410
2004.1	0.06807
2004.2	0.06407
2004.3	0.06478

4. Click "Solve the model and examine the results".

This experiment is designed to keep U.S. exports, EX, equal to γ times potential output, YS, where γ is the ratio of EX to YS in 2000:3, which is 0.11408. Originally this was done by exogenous changes in other countries' demands for U.S. goods. It is, however, easier just to change $USPSI2$ in the manner above, which has been done here.

6.7 Experiment 7: Experiments 5 and 6 Combined

1. Combine experiments 5 and 6.

Chapter 7

Estimated Effects of the U.S. Stimulus Bill

This chapter presents the stimulus experiment in Section 5.5, *Estimated Macroeconomic Effects of the U.S. Stimulus Bill*, in **MM**. The MCJ model forecast is the baseline forecast for this experiment.

7.1 COG Multipliers

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2009 through 2016.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Change exogenous variables" and ask to change COG for the United States. Type in the COG increases quarter by quarter. Be sure to save the changes once you are done. The COG increases are (1.0 percent of GDPR):

	COG INCREASES
2009.1	35.93750
2009.2	35.88875
2009.3	36.00600
2009.4	36.35450
2010.1	36.51200
2010.2	36.86475
2010.3	37.11325
2010.4	37.34725
2011.1	37.20325
2011.2	37.47375
2011.3	37.55275
2011.4	37.97550
2012.1	38.22750
2012.2	38.40600
2012.3	38.45175
2012.4	38.46050
2013.1	38.72975
2013.2	38.80400
2013.3	39.10325
2013.4	39.48500
2014.1	39.39375
2014.2	39.83950
2014.3	40.34850
2014.4	40.55050
2015.1	40.87475
2015.2	41.15200
2015.3	41.31900
2015.4	41.36900
2016.1	41.42900
2016.2	41.65850
2016.3	41.94500
2016.4	42.12850

5. Click “Solve the model and examine the results”.

7.2 $TRGHQ$ Multipliers

1. Click “Solve” under “MCJ Model” in the left menu and copy MCJBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2009 through 2016.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Change exogenous variables" and ask to change $TRGHQ$ for the United States. Type in the $TRGHQ$ increases quarter by quarter. Be sure to save the changes once you are done. The $TRGHQ$ increases are the same as the COG increases above.

5. Click "Solve the model and examine the results".

7.3 Stimulus Experiment

This experiment duplicates the results in TableS 4 and 5 in Subsection 5.5.3, *The Stimulus Experiment*, in **MM**.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2009 through 2016.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Change exogenous variables" and ask to change $TRGHQ$ for the United States. Then type in the following $TRGHQ$ changes:

	CHANGES IN TRGHQ
2009.2	-79.0
2009.3	-91.4
2009.4	-91.4
2010.1	-91.4
2010.2	-91.4
2010.3	-91.4
2010.4	-25.4
2011.1	-25.4
2011.2	-25.4
2011.3	-25.4
2011.4	-2.8
2012.1	-2.8
2012.2	-2.8
2012.3	-2.8
2012.4	-2.7

Then ask to change COG for the United States. Then type in the following COG changes:

	CHANGES IN COG
2009.2	-5.4
2009.3	-7.6
2009.4	-7.5
2010.1	-7.5
2010.2	-7.5
2010.3	-7.4
2010.4	-7.9
2011.1	-7.8
2011.2	-7.8
2011.3	-7.7
2011.4	-6.0
2012.1	-5.9
2012.2	-5.9
2012.3	-5.8
2012.4	-3.9

Then click "Commit to Changes."

5. Click "Solve the model and examine the results".

The differences between the new forecast values and the base values are the *negative* of the estimated effects of the stimulus bill. The new values are estimates assuming no stimulus bill, and the base values are estimates assuming the stimulus bill (which is the actual situation since the bill passed). The signs are reversed in Tables 4 and 5 in Subsection 5.5.3 in **MM**.

Chapter 8

The Financial Crisis

This chapter explains how to perform the experiment in Section 5.7.6, "What if Financial and Housing Wealth had not Fallen in 2008–2009?" in **MM**.

1. Click "Solve" under "MCJ Model" in the left menu and copy MCJBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2008 through 2013.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25).
5. Click "Change exogenous variables" and ask to change CG for the United States. Then enter quarter by quarter the changes for CG for 2008:1–2013:4. (Make sure to save the changes once you are done.) These changes are:

	CG CHANGES
2008.1	2283.99247
2008.2	1119.95693
2008.3	2060.50436
2008.4	4053.67245
2009.1	1570.98341
2009.2	-691.94052
2009.3	-1178.64526
2009.4	-43.93852
2010.1	-328.85815
2010.2	1771.42200
2010.3	-1360.65187
2010.4	-1810.68381
2011.1	-726.05368
2011.2	608.72750
2011.3	3338.68718
2011.4	-811.28645
2012.1	-1707.83494
2012.2	1276.83167
2012.3	-861.18089
2012.4	-61.91098
2013.1	-1683.93040
2013.2	-188.78874
2013.3	-1267.63727
2013.4	-1492.54796

6. Click “Change exogenous variables” again and ask to change $PSI14$ for the United States. Ask to replace each existing value with 1.97. Hit the enter key and then be sure to save the changes once you are done.

7. Click “Solve the model and examine the results”.

Chapter 9

Trade Models and Macroeconomics

This chapter explains how to perform the China experiment Fair (2019), "Trade Models and Macroeconomics," which is available on the website. It uses the MCJ2 model rather than the MCJ model.

1. Click "Solve" under "MCJ2 Model" in the left menu and copy MCJ2BASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2007.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Modify equations by the use of add factors" and ask to change $CHPX$ for China. Then add -0.20 to all the values. Hit the enter key and then be sure to save the changes once you are done.
5. Click "Solve the model and examine the results".